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PATENTS
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REPLACEMENT CLAIMS AS NUMBERED

1. A routing system for distributing packets comprising:

at least one uplink connection that receives and sends packets,

a plurality of port adapters that receive and send packets;

a plurality of route processing engines;

a mechanism that performs a hashing function on at least a portion of network layer information in the packets received to determine a distribution of the packets to the route processing engines for processing by the engines, and to determine ordered packets belonging to the same flow, the distribution being such that an ordered packet flow is preserved by being sent to a single route processing engine.

3. The routing system of claim 1, also including a crossbar.

9. The routing system of claim 1, wherein processing power of said system can be scaled by adding additional route processing engines to said plurality of route processing engines.

11. A routing system for distributing packets in a network, comprising:

a plurality of network interfaces including port adapters that send and receive packets,

a plurality of route processing engines;

a fabric interconnecting said plurality of network interfaces and said plurality of route processing engines;

wherein each of said plurality of network interfaces uses a hashing function to determine a distribution of the received packets among said plurality of route processing engines; and

wherein the hashing function is carried out on at least a portion of network layer information in the packets, and to determine ordered packets belonging to the same flow, and the distribution being such that an ordered packet flow is preserved by being sent to a single route processing engine.

12. The routing system of claim 11, wherein said fabric includes a crossbar.

16. The routing system of claim 11, wherein said network interfaces include at least one uplink connection to an external network.

17. A method for selecting one processing engine of a plurality of processing engines for processing packets that originates from a source external source, the method comprising the steps of:

hashing at least a portion of network layer information of at least one packet to determine a distribution of the packets to the processing engines;

identifying from the network layer information the at least one packet that belongs to a same ordered packet flow, and

selecting the one processing engine based upon, at least in part, the portion of the network layer information in such a way as to preserve the ordered packet flow.

18. The method of claim 17, wherein the network layer flow information comprises one or more of the following network information: a network source address of the at least one packet, a network destination address of the at least one packet , a network destination address of the at least one packet, a source port of the at least one packet, and a protocol type value of the at least one packet.

20. The method of claim 17, wherein the hash value is computed by logically XORing the addresses, the port, and the protocol type value.

21. The method of claim 17, further comprising the steps of:

providing a table containing entries for use in selecting the one processing engine; and

selecting one entry in the table specified by an index value, the index value being based upon the hash value, and

using the index value to direct the selection of the one processing engine for those related packets that belong to the same packet flow.

23. The method of claim 17, wherein the at least one packet is the one of a plurality of packets, and the step of hashing is performed using a hashing function that causes the packets to be at least mostly evenly distributed among the processing engines.

24. The method of claim 17, wherein the processing engines are comprised in a routing system.

25. The method of claim 17, wherein the at least one ordered flow comprises a plurality of ordered flows, and the step of hashing is performed such that only a single respective processing engine is selected to process respective packets belonging to a respective original flow.

26. A system for selecting one processing engine of a plurality of processing engines for processing at least one packet, the system comprising:

means for examining at least a portion of network layer information of the at least one packet that comprises one or more of the following network information: a network source address of the at least one packet, a network destination address of the at least one packet, a source port of the at least one packet, a destination address of the at least one packet, and a protocol type value of the at least one packet, and

means for selecting the one processing engine based upon, at least in part, the portion of the network layer flow information in such a way as to preserve an original packet flow comprising the at least one packet.

28. The system of claim 26, wherein the means for examining comprises means for hashing the portion of the network layer information to produce a hash value, and the hash value is used, at least in part, to select the one processing engine.

29. The system of claim 28, wherein the hash value is computed by logically XORing the addresses, the ports, and the protocol type value.

30. The system of claim 28, further comprising:

means for providing a table containing entries for use in selecting the one processing engine; and

means for selecting one entry in the table specified by an index value, the index value being based upon the hash value.

31. The system of claim 26, wherein the at least one packet is one of a plurality of packets in at least one original flow, and the means for hashing carries out a hashing function that preserves the at least one original flow of the packets.

32. The system of claim 26, wherein the at least one packet is one of a plurality of packets, and the means for hashing carries out a hashing function that causes the packets to be least mostly evenly distributed among the processing engines.

33. The system of claim 26, wherein the processing engines are comprised in a routing system.

34. The system of claim 31, wherein the at least one ordered flow comprises a plurality of ordered flows, and the means for hashing carries out the hashing such that only a single respective processing engine is selected to process respective packets belonging to a respective ordered flow.

35. Computer-readable memory comprising computer-executable program instruction for selecting one processing engine of a plurality of processing engines for processing at least one packet, the instructions, when executed, causing:

examining of at least a portion of network layer information of the at least one packet; wherein the network layer information comprises one or more of the following network information: a network source address of the at least one packet, a network destination address of the at least one packet, a source port of the at least one packet, a destination address of the at least one packet, and a protocol type value of the at least one packet, and

selecting of the one processing engine based upon, at least in part, the portion of the network layer flow information in such a way as to preserve an ordered packet flow comprising the at least one packet.

37. Memory of claim 35 wherein the examining comprises hashing the portion of the network layer flow information to produce a hash value, and the hash value is used, at least in part, to select the one processing engine.

38. Memory of claim 37, wherein the hash value is computed by logically XORing the addresses, the ports, and the protocol type value.

39. Memory of claim 37, wherein, when executed, the instructions also cause:

providing of a table containing entries for use in selecting the one processing engine; and

selecting of one entry in the table specified by an index value, the index value being based upon the hash value.

40. Memory of claim 35, wherein the at least one packet is one of a plurality of packets in at least one original flow, and the hashing is performed using a hashing function that preserves the at least one original flow of the packets.

41. Memory of claim 35, wherein the at least one packet is one of the plurality of packets, and the hashing is performed using a hashing function that causes the packets to be at least mostly evenly distributed among the processing engines.

42. Memory of claim 35, wherein the processing engines are comprised in a routing system.

43. Memory of claim 40, wherein the at least one original flow comprises a plurality of original flows, and the hashing is performed such that only a single respective processing engine is selected to process respective packets belonging to a respective original flow.